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Influence of Ancient Settlement in the Contemporary Maya Forest: Investigating Land Use at El Pilar

Submitted to the Belize Department of Archaeology
BRASS/El Pilar 2001 Field Season

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with contributions by
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and Help for Progress

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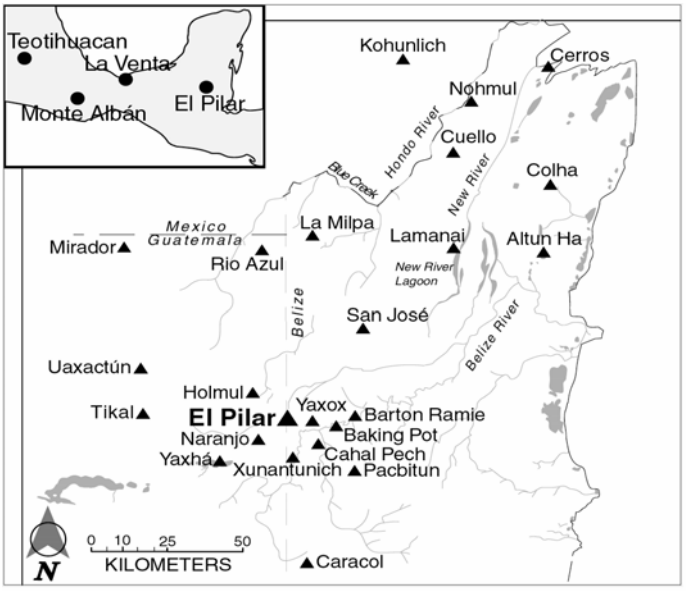
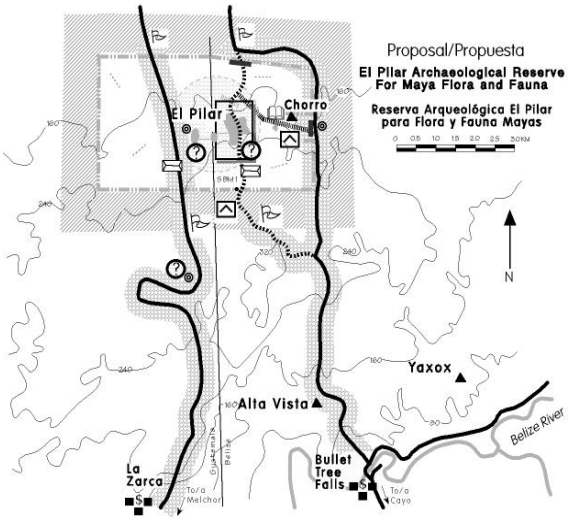
OBJECTIVES

While there are debates on the evolution of the ancient Maya, it is acknowledged that their accomplishments were based on the successful development and management of regional resources in the Maya lowlands over a period of four millennia. This BRASS/El Pilar Program is developing a settlement distribution and density database for the ancient Maya of El Pilar. The data will be gathered over several years, and this report focuses on the results of the 2001 filed season. The objective of the field data collection is to 1) establish an inventory of archaeological remains within the El Pilar Archaeological Reserve, 2) assess the nature and temporal sequence of the settlement within the reserve for management purposes, 3) evaluate factors creating the patterns, hierarchy, and order of the Maya human landscape.



We have built a regional foundation with a Geographic Information System (GIS) and are working to create an effective and useful Maya forest GIS based field data collection, digitized environmental inputs, and interpreted satellite imagery. The field research for a site-specific



inventory of ancient Maya settlements around the urban center of El Pilar is a critical part of the research. The settlement pattern database at El Pilar will increase the resolution of the regional and local GIS data now in development. Our results will present the first GIS approach to Maya settlement and contribute to understanding the evolution of Maya civilization as well as to conservation planning for our world's cultural heritage at the last terrestrial frontier.

The specific objectives for the BRASS/El Pilar 2001 season included:

1. The development of the field settlement survey of the El Pilar Archaeological Reserve for Maya Flora and Fauna using traditional surface survey methods to locate remains of Maya house remains;
2. Fix locations of control points for physically mapping coordinates of the residential sites within the reserve;
3. Conservation assessment of Plaza Jobo by examining access ways into the area;
4. Conservation assessment EP7 façade and the consolidation of the tunnel entrance;
5. Promote the continued development of the Maya forest garden;
6. Design trail guides for the forest garden and El Pilar;
7. Produce research level map data for the Maya forest GIS.

Resources and Settlement of the Ancient Maya

The central Maya lowland environment presents a number of diverse resources exploited over the course of Maya prehistory. Between 1500-1000 BC in the Middle Preclassic (Puleston 1973; Puleston and Puleston 1971, 1972; Rice 1976, 1981, 1993; see Ashmore 1981) pioneering settlements focused in areas with perennial water and useful agricultural land, such as Northern Belize (Green 1973; Hammond 1975; 1985). Settlements expanded over the area, focused initially on rivers, then lakes and, ultimately, spread across the entire interior lowland area (Culbert and Rice 1990; Sabloff and Henderson 1989). Evidence indicates that the interior Petén area around Tikal dominated the region in the Late Classic Period, AD 600-900 (Culbert et al. 1990; Martin and Grube 1995; Mathews 1985; Marcus 1993).

Many scholars focus on the dramatic Classic Maya collapse (e.g., Culbert 1973, 1988), but more mysterious is the long sustained, methodical, growth of more than two millennia widely documented in the archaeological record (cf. Marcus 1993). The expansion of Maya settlements and the evolution of Maya societal complexity were based on gradual rise in population and concomitant agricultural intensification over 40

centuries (cf. Boserup 1965, 1981; Cohen 1977). The centralization process spanned more than 1200 years, supporting the growth of the Classic Maya civilization based on the development and management of the assets of the Maya forest (Fedick 1996; Graham 1987; Sanders 1977).

There are four basic land resources that together form the range of environmental variation in the central Maya lowlands (Fedick and Ford 1990; see Turner 1978), a resource mosaic utilized by both the ancient and modern populations of the region (see Schwartz 1992). These resources are:

1. Well-drained Ridges: Primary Production Resources
2. Poorly-Drained Lowlands: Secondary Production Resources
3. Riverine-Associated Swamps: Secondary Production Resources
4. Closed Depression Swamps: Non-Production Resources

The well-drained zones most preferred by the Maya for farming are unevenly distributed across the region resulting in dispersed settlement patterns (Ford 1986; see also Freidel 1981). They comprise less than one-sixth of the area of Northern Belize, but nearly half of the interior Petén area around Tikal. There is a distinct relationship between the availability of well-drained ridges, settlement density, and the regional Maya hierarchy (Fedick and Ford 1990). These regional distinctions are seen in settlement size hierarchies ranked by both population and settlement area (see Marcus 1993, Flannery 1972).

The research on the site-specific nature of the ancient Maya economic landscape will build a settlement picture of the urban quality of the El Pilar center and provide a foundation for examining the geography of ancient settlement patterns. In addition, the work will refine a predictive settlement model with field tests for the location of ancient Maya settlements, and develop a geographically based view of Maya settlement pattern dynamics over time from the initial pioneering distributions, through the height of the Maya civilization, and into the collapse. Our objectives will at once provide a basis for appreciating the geographic bases of Maya settlement and will help in the management of these valuable and irreplaceable resources.

Field Strategy:
Site-Specific Investigations at El Pilar

The field methods will follow the strategies developed over the past two decades of work in the region (Ford 1986, Fedick 1989, Ford and Fedick 1992) and tested in the 2000 field season at El Pilar. Expanding on the essential mapping design based on transects, the El Pilar survey is concentrated in the defined reserve area of El Pilar, incorporating the general central urban zone of the site as well as varied topographic and environmental features that surround the monuments. The final survey will embrace the civic ceremonial monuments as well as settlement up to 1.5 km from the civic core zone and incorporate the entire reserve area.

We have begun the settlement and topographic survey of the 2000-hectare reserve with the compilation of the central control point system into a GIS. The basic

foundation of the survey is the terrestrial and GPS control point network (Giardin 1999; Poe 1998, 1999, 2000). This network will be extended and, once complete, all areas of the reserve will be incorporated into one system. We began with the known monumental architectural features within the reserve (Ford 1987; Ford and Orrego 1995; Ford et al. 1998): Chorro, Kum, Pilar Poniente. These major monuments are located with the GPS. The survey beyond the monumental zones is now the main priority. The settlement survey of El Pilar, initiated by the 2001 season, is anticipated to take several years to complete.

The area of the El Pilar Archaeological Reserve is divided into subsets based on the existing and expanding network of control points and will expand over the course of each season's work to cover the entire 2000-acre reserve. Traverses established for surface reconnaissance along mapped transects are oriented to the cardinal directions using the total station. Paths for field surveys are located with the pace and Burton compass method. Data collected on survey forms record potential sites along with verbal notes on vegetation and topographic changes. These aid in the subsequent mapping phases. The mapping or survey teams follow the surface survey, returning to designated areas to assess the existence, extent, and type of cultural remains. Using a tape and Burton compass method, the residential site sketches are oriented to the transects. The results of these surveys form the corpus of the settlement data.

Research at the El Pilar core area continued in tandem with the site survey. Target areas with excavations in process were the focus of the 2001 season. The major effort was aimed at the Plaza Jobo area of the H'Mena acropolis. This area has been partially excavated, covered and consolidated through field seasons since 1996. Examinations around the plaza interior, evaluation of drainage areas, and the opening of the original entrance to the plaza were the aims of our season. The objective was to create the context upon which to design a complete consolidation program for that zone. Removal of collapse in strategic parts of the plaza to understand the access ways to the plaza and detailed mapping were conducted.

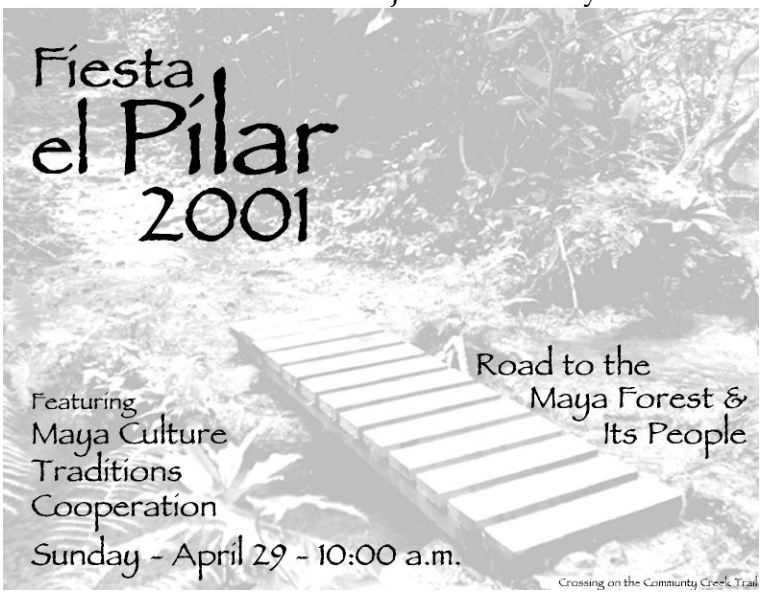
In addition, attention to Plaza Copal at the front of EP7 was examined to determine the state of the tunnel entrance. The western and front entrance to the tunnel was consolidated leaving the eastern and rear excavated entrance of the EP7 tunnel with a locked door entrance. Also, we conducted an assessment for the development of the façade of EP7. The deteriorating roof over the stair was removed and the stairs covered with a protective mantel of earth after completing an evaluation of consolidation strategies.

The basic field research is only one facet of our focus at El Pilar. The BRASS/El Pilar Program continued its commitment to strengthening the infrastructure at the site. This included repairs of equipment used by the caretakers, supply of new equipment for the site maintenance, repairs on the trails, replacement of trail signs, painting the trailhead signs, landscape development, and Amigos de El Pilar orientation. New rest areas were established, picnic stops developed, and trails oriented. This included the full development of the Tzunu'un Maya Forest Trail Guide. The text of this guide had been completed in 1998 and was included in the 1998 field season report to the

Department of Archaeology. This season, the project photographer, Clarissa Guggenheim, produced the illustrations for the guide. This pamphlet-sized trail guide is to be sold by Amigos de El Pilar.

The Tzunu'un Maya Forest Trail Guide was assembled and the layout prepared in PageMaker. The design was submitted to Help for Progress and, with the support of the Department of Archaeology and the Protected Area Conservation Trust, was published for distribution in July 2001. The comprehensive El Pilar Trail Guide has also been written and submitted with 2000 field season report to the Department of Archaeology. This is currently in the design and layout phase for publication by the end of the year in collaboration with Help for Progress.

Work on park resources was accelerated to meet the needs of the Fiesta El Pilar. The 2,500 visitors came to El Pilar from the local area, the regional, as well as international travelers all joined in a day of celebration with cultural events, indigenous foods, arts and crafts sales, and family enjoyment. After the Fiesta, overall assessments, maintenance, and trail redesign were required to compensate for the large influx of visitors. The growth in popularity of this celebration over nearly a decade suggests that a re-evaluation of event management and organization is needed. One strategy for future events is to hold the cultural events at the village and the field events at the site.



The fieldwork at El Pilar maintained its traditional outreach components with the development of the demonstration Maya forest garden and inclusion of traditional cultivators from the community. This aspect of the program ranges widely and is based on the needs and requests from the community. Work with the Amigos de El Pilar included workshops and discussions with the membership and included: outreach and external relations, leadership and internal relations, and finance management as well as tours and presentations about El Pilar. Collaborations with the NGO Help For Progress promoted interactions with the local tertiary schools, with media, and with the development of a local bibliography on the forest garden.

The El Pilar philosophy is a collaborative one, designed to build bridges from the community to the protected area with the help of the private sector, the government, and science. The combined activities of the BRASS/El Pilar Program work together to fostering local investment in the El Pilar Archaeological Reserve for Maya Flora and Fauna.

EL PILAR SETTLEMENT SURVEY

Objectives of the Survey

The objectives of the El Pilar settlement survey are to detect the location of cultural remains, ecological zones, and topographic relief within the El Pilar Archaeological Reserve for Maya Flora and Fauna. The cultural remains include architectural features, storage chultuns, reservoirs or aguadas, quarries, terraces, agricultural alignments, and parapets. Ecologically, the survey records vegetation patterns, forest cover, height of canopy, dominant trees, as well as and disturbances such as logging roads and milpa clearings. Survey crews also make notes regarding the topography of the area and these are followed up with GPS and transit elevations. All of these features are designed to be located by the UTM (Universal Transverse Mercator) grid for comparative spatial utilization and incorporated into a GIS database for distribution.

This season the El Pilar settlement survey focused on the west side of the monumental area of Nohol and Xaman Pilar. The aim of the season's work was to map the area north, south and west of Bryan & Murphy Causeway in an effort to determine the relative access, settlement relationships, and drainage limits. The overall objective for the research was to study the relationship between topography and drainage with respect to monumental and residential structures at El Pilar. House remains, quarries, aguadas, monumental architecture and other cultural modifications of the landscape were therefore of great importance. The location of the residential and other cultural features provide a foundation for the investigation of patterning in relation to soils and water management and for the development of the settlement chronology of the city. Future seasons will feature test pit excavations for chronological materials and soil samples within the surveyed and mapped area. Results from these studies will provide information on Maya cities and the use of causeways.

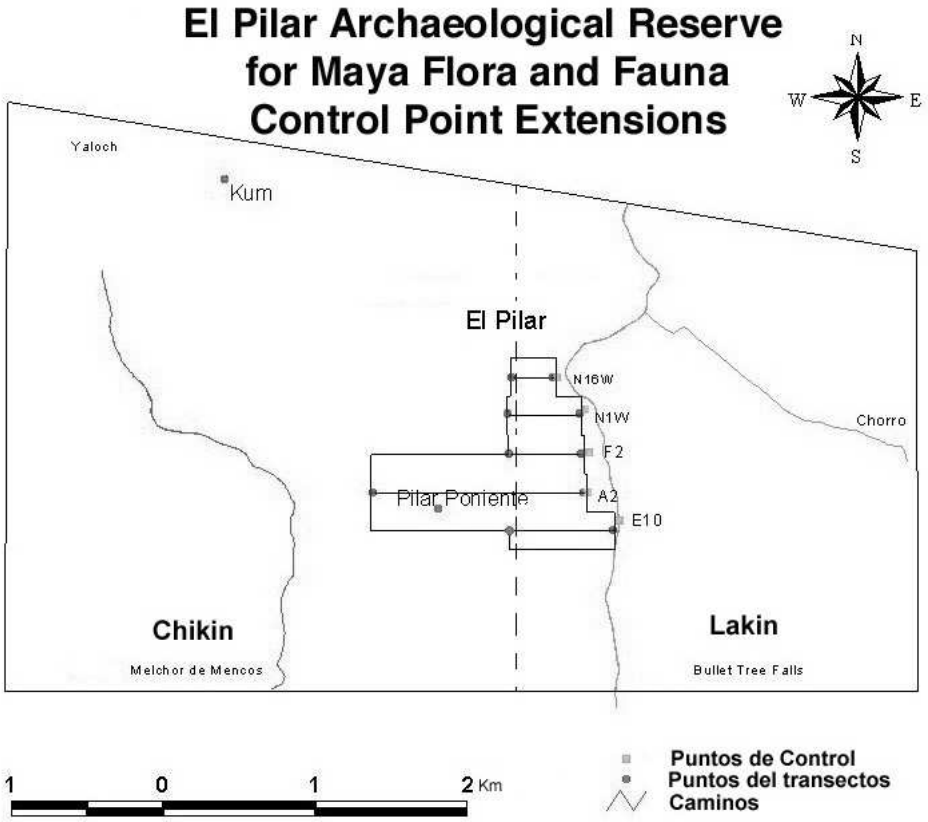
Methodology

To identify and locate the cultural remains, our survey strategy involved several steps. We set up five transects that ran in east-west direction. Initial setup for the survey phase and additional precision surveying was carried out with a Topcon GTS-203 total station. Control points established in previous seasons with the Topcon and with Trimble TDC-1 GPS units provided our starting point. In addition, tape and Brunton compass were used to map the individual mound groups on paper.

The transects were set up at 250 m intervals and originally did not extend beyond Easting 271350, between Nohol and Pilar Poniente. Later in the season we were able to extend one transect beyond Pilar Poniente. Transects were established with the transit and the survey coverage was completed with a Brunton compass. The transects provided the backbone for the survey, the fixed mapped points upon which the mapping operations relied. Each transects had different lengths depending on their

starting and ending point. The survey provided 120 hectares of coverage and presents a complex view of the city residential settlements.

The transects were labeled after the starting point which was a benchmark with known UTM coordinates. The first transect started at control point A2, on the edge of Plaza Copal in the southern part of El Pilar. It was originally 500 m long but was later extended to 1400 m to go beyond Pilar Poniente. The second transect, E10, was 700 m long. The transect E10 was laid out to the south of A2 and tied into the 1962 control point established by the Interamerican Geodedic Survey the roads of the region were mapped. E10 is an important point in the El Pilar system as this benchmark provides our only elevation for the site. North of A2, we established the transect F2 at Plaza Faisan. Transect F2 was 500 m long. The forth transect was N1W starting north of Plaza Lec. This transect was 500 m long, The last transect to be set up was N16W, based on a control point set up in the settlement area north of the El Pilar monuments. This transect was the shortest one, only 300 m in length. The total area surveyed and mapped was approximately 120 hectares, including an area adjacent to Kum, a minor center 2.5 km to the northwest of Pilar Poniente.



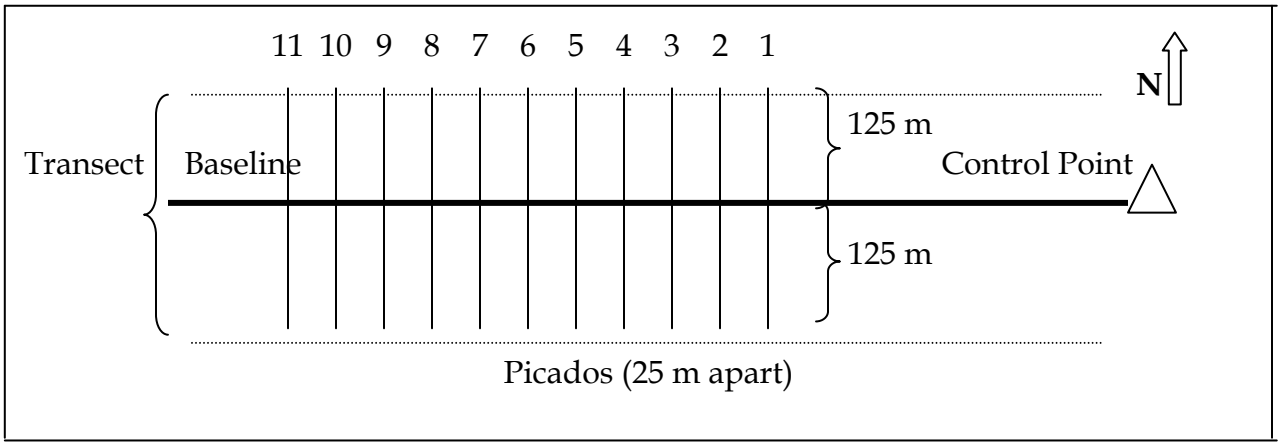
Topography is a critical part of the understanding of settlement patterns, monument access, and water management. The area around El Pilar is composed of hills and flatlands. Our surveys demonstrate a distinct preference for the hills, yet there is occupation in the wide expanse of low areas between the monumental sections of Nohol and Poniente. Consequently, topographic data were a high priority. As we set up the baseline for each transect, we also shot topographic points. These were taken to the north and south of each baseline as far as there was laser visibility in the forest. We were able to expand from the transects to incorporate more topographic points along the survey paths (picados) of the A2 transect, thus providing more points further from

the baseline. The primary goal in this phase was to map hills and flatlands that are important features in the topography of El Pilar.

Transect	Start point	Northing	Easting	Elevation	End point	Northing	Easting	Elevation
E10	E10-1	1908472.252	272014.786	228.46	E10-28	1908561.461	271344.097	217.67
A2	A2-1	1908717.574	271825.179	226.04	A2-61	1908720.236	270434.464	207.99
F2	F2-1	1908967.88	271808.335	218.05	F2-20	1908971.487	271335.478	205.59
N1W	N1W-1	1909229.89	271794.072	226.59	N1W-20	1909234.14	271320.761	201.86
N16W	N16W-1	1909468.441	271625.211	199.24	N16W-12	1909469.222	271351.299	196.28

Survey and Mapping

The basic methodology of the survey was to establish a baseline from which small side paths (picados) could be established to facilitate survey coverage. From the baseline, picados were cut in north-south direction. These were 125 m long on either side of the baseline and 25 m apart along the baseline. Each picado was named after the baseline origin point, for example A2-18N, was the 18th picado north of baseline A2. Every picado was marked off in the field by a stake and flagging tape. These stakes had known coordinates in the UTM grid determined with the Topcon transit system. This system, and modifications there to, formed the process by which we accomplished the survey for 2001. When the A2 transect was extended beyond Pilar Poniente, we decided to extend the picados 250 m from the baseline. This allowed us to cover a larger area without establishing more transects. A team made an initial assessment of each picado, noting cultural, ecological, and terrain features surveyed along the path.



The survey crew consisted of one crew chief, surveyors and workmen. The crew chief assigned different picados to the crew. The crew chief also kept records on a daily survey notes form where he or she wrote down which picados were surveyed and by whom. General notes on what was found along the picados were also recorded on this form to augment the picado survey forms.

The surveyor's notes included a variety of notations. Vegetation changes such as thick bush, high canopy, ferns, low or high visibility was recorded. Logging roads and other contemporary features that were clearly visible were noted since they can

help to relocate areas in the future. Logging roads are also indications of disturbance of the cultural remains.

Ancient quarries were recorded as examples of features that are important in the understanding of land use in the past and for the consolidation program at El Pilar for the future. These areas provided stone materials for the construction of El Pilar and could provide a resource for the consolidation work at the site. These areas are potential locations of good stone material for development of the cultural resource of El Pilar.

The surveyor's reporting included areas with little vegetation cover and useful in the location of control points with the GPS. The development of our control point system is dependent on the combined strategies of terrestrial survey and GPS. We have found that the best GPS results are found where there is greater sky visibility.

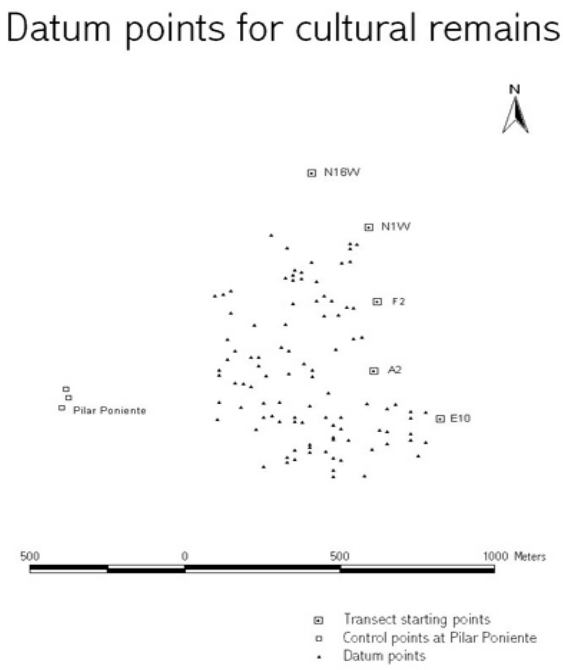
Another important feature recorded in the surveyor's notes and drawings was the presence of looters trenches. With continued presence of caretakers at the monuments of El Pilar and our through program to protect the monuments, most of the looter trenches have been back filled. This has increased the awareness of the problems of looting, but not the resolution. Our surveys have revealed evidence that the smaller structures around the site have not been equally protected. This underscores the need for community participation in the protection of the cultural remains of El Pilar, as well as other sites of the local area and the Maya forest as a whole. There is remarkable architecture around the main monuments of El Pilar, and as we survey more of the reserve, we are finding that there are minor monuments as well. Most of the larger architectural remains of these minor monuments are looted, presenting problems for not only the conservation of cultural resources but also more critically for the archaeologists, the understanding of prehistory in the area. Looting is a serious risk that the site faces, as its presence becomes better known. The Amigos de El Pilar are in an excellent position to assist in alerting the people to the problem and to partner with authorities in the development of a solution.

The initial pedestrian survey targets areas for more intensive coverage and mapping. The targeted cultural remains identified in the initial survey were each revisited for the final determinations and to develop the detailed maps. The mapping team consisted of at least three people. The mapping crew used the initial sketch from the picado survey to relocate the potential features. Where confirmed cultural remains were found, they began the mapping process. This involved the establishment of a datum point within cultural features for the detailed mapping to proceed. The cultural features were then plotted on graph paper using tape and Brunton compass.

Our methods evolved in the field were based on experience and knowledge. The objective was to develop composite sketch maps of each residential unit and other cultural features and to locate the area relative to the greater map of El Pilar. The methods to achieve the desired results changed over the course of the season.

In the beginning, the mapping teams drew the detailed sketch maps in the field of features as they were encountered. Later on, we took notes on the features and their locations with the compass with the measurements and compiled the maps in the lab.

Both methods have their advantage. The field mapping was good when the crew was new and inexperienced. It helped them to check their drawings before giving them to the survey director. The field note-taking and lab compilation was more efficient when the crews were experienced. We found was that we could cover a larger area in the field if we compiled the maps in the lab.



Following the field survey, data was processed in the lab and the cultural features mapped were completed for inclusion in the final maps. Collected coordinates from the total station were entered into ArcView to plot the survey zone. The sketch maps were logged in by the location of the datum from a known point on the baseline.

We have devised a system for labeling the cultural features at El Pilar by reference to the UTM grid. Each feature, single structures, and groups will be labeled according to the system will be given an identifier that corresponds to a portion of the UTM-coordinates. To minimize the amount of numbers of our identifier and to insure location specificity, we dropped the first two coefficients in the Northing and the first one in the Easting. The coordinate would also be rounded to the nearest decimeter, since features are normally more than ten meters apart. A labeled feature within the system with the coordinates of N. 1908717.484 and Easting 271375.038 would be labeled: 0871 – 7137. In this way, we will be able to enumerate all features in the reserve.

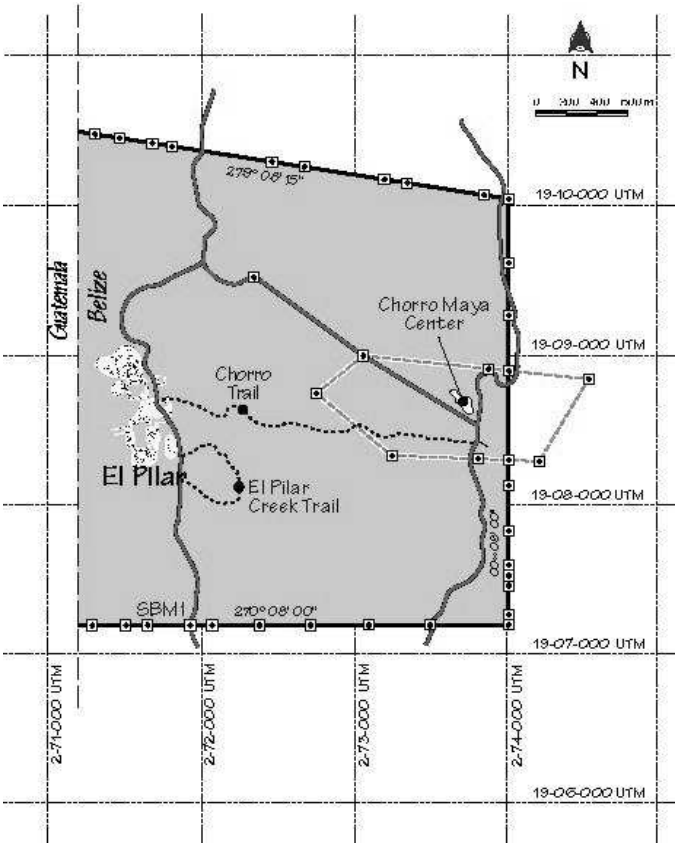
DEVELOPING MONITORING FOR THE EL PILAR ARCHAEOLOGICAL RESERVE

The management of protected areas in Mesoamerica face a number of challenges, among them strategies for collecting and comparing data collected by on-site park managers and research projects within the areas. As natural and cultural environmental data for specific areas are accumulated, systematic strategies of data collection and recording is essential. The Wildlife Conservation Society, WCS, has set in motion a series of environmental monitoring protocols for the greater Mesoamerica area and specifically for the regional Maya forest of Mexico, Guatemala, and Belize. These protocols are designed for use in the region. One new area for implementation is the El

Pilar Archaeological Reserve for Maya Flora and Fauna, a special case of a protected cultural and natural zone crossing the international boundary of Belize and Guatemala. To expand the application of the protocols, the El Pilar Program team effort has focused on the establishing a control point system that will anchor monitoring data collected within the 2000-hectare reserve. Here, we outline the fieldwork, data processing results, and activities that set the stage for long term natural and cultural environmental monitoring at El Pilar.

Background

The monumental core of El Pilar was first mapped in 1984 and the first local control points established. These early control points served to orient the subsequent detailed surveys that began in 1993. In 1995, the boundaries of the El Pilar Archaeological Reserve in Belize were established and provided the 2-dimensional location of the reserve and the first basis for cadastral accuracy in the location of cultural and natural inventories inside the reserve. Subsequent expansion of the reserve to include the monuments in Guatemala was based on these controls.



In 1998, the contiguous boundaries for El Pilar were established on the ground, enclosing an area of more than 2000 hectares, and protecting the cultural monuments of the ancient Maya and the natural resources that surround the site. Access to the area continues to be from Bullet Tree Falls, Cayo, Belize, but the community identity with El Pilar includes Melchor de Mencos, Peten, Guatemala as well as the communities of Cayo, Belize.

Data Organization

Data collected at El Pilar are part of a long-term research, development, and conservation program designed to promote greater conservation awareness of resources of the region. To pursue the cross-scale Maya forest research linked to El Pilar, the three conceptual scales have to be managed together. The use of the Geographic Information System, GIS, assists in the management and integration of data from the region, the local zones, and the site-specific areas.

The three scales are:

1. Small-scale analyses embrace the largest area and include the entire Maya Forest region. The range of scale runs from 1:250 K and greater and incorporates the data from diverse areas of Maya Forest (south Mexico, north Guatemala, and Belize).
2. Medium-scale analyses include local focus and greater data detail. This scale ranges around the scales 1:50 K – 1:20 K and incorporates local areas such as El Pilar Cayo – Belize and Tikal in Guatemala.
3. Large-scale analysis is site-specific and is highly focused in character and detail. This is the level of resource monitoring based on controls within the El Pilar reserve area. This scale range runs from 1:6 K and less and concentrates on monitoring and inventories for the EL Pilar Archaeological Reserve. The data are collected as inventories, maps, excavations linked to control points. The control points are the most basic level of location information for El Pilar.

Large Scale Control {Point Propagation Survey Methods

	Mapped Areas	**Environmental Features**	**Specific data**
Georeferencing	3 inter-visible control points	Control Points	UTM 2*2 grid
Method	Carrier mode processing: 45min Differential correction	GPS with carrier mode processing Or Terrestrial transit survey with least square adjustment	GPS or terrestrial transit set up from control points
Accuracy	< 10cm	< 10cm	10cm
Survey	Total station	Total station	Laptop
Drawing	GIS / CAD	CAD	GIS
Accuracy	10cm	10cm	The unit

Equipment

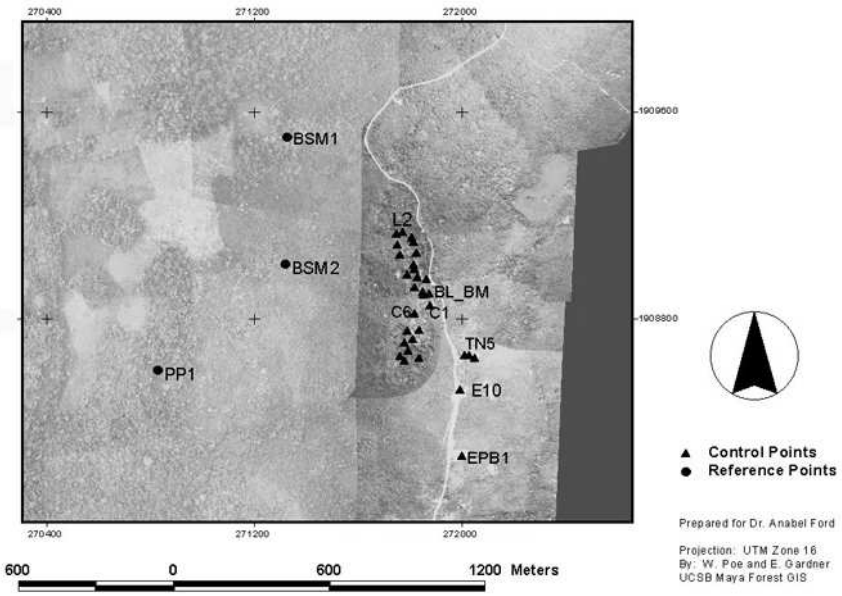
	Instrument	**Datalogger**
GPS	Mono-frequency Dual-frequency quicker	GIS Datalogger like TDC1 If possible: Trimble TSC1
Total station	TopCon GTS 203	TopCon FS Husky If possible: Trimble TSC1
Laptop	Simple laptop, resistant to the weather	

The Surveys and Control Point Propagation

The development of the surveys and the establishment of the control point system are based on the foundation of work related to the mapping phased of the major

architecture at El Pilar. These data points were established based on a local independent project grid system oriented to magnetic north in 1993. To create a site control point system that tied into the reserve boundaries and promoted a location system with reference to the region required conversion to the UTM grid. This was accomplished mathematically. Once this basic data were available for the El Pilar marker system, we were able to re-survey the internal system for accuracy. From this base we designed a control point propagation system founded on the core network and the boundary survey.

El Pilar Control and Reference Point Network



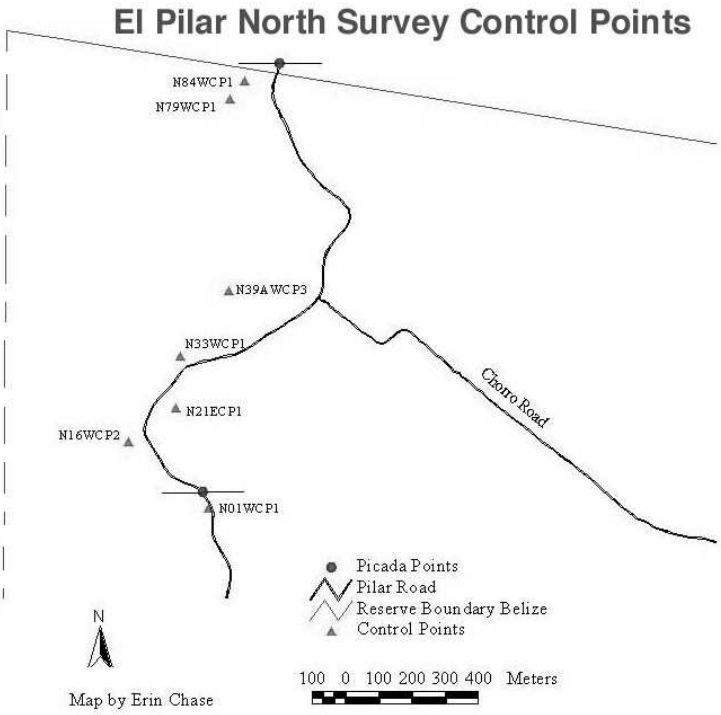
The control points for the internal El Pilar system were corrected using the UTM designation for the El Pilar Archaeological reserve boundary survey of the Belize Department of Land and Survey. The fixed point is called SBM1 and is referenced by the Belize Department of Lands. This is specified in the statutory description of the El Pilar Archaeological Reserve for Maya Flora and Fauna (*Ancient Monuments and Antiquities El Pilar Archaeological Reserve for Maya Flora and Fauna order, 1998* Statutory Instrument No. 54 of 1998). We have used as our elevation the results of the Inter American Geodetic Survey Marker E 10, also used in the original El Pilar reference system.

UTM 16N WGS84

Point	Northing	Easting	Elevation
EPB1	1908269.129	271999.533	240.363

We have found that there are some discrepancies among systems and have been working to resolve the variations with the support of Keith Clarke of UCSB. A listing of the core control points for El Pilar are given in Appendix I.

Additional propagation of the control points continued with the research activities. First, the archaeological settlement survey involved extending control points using the transit and the GPS. Additional control points were established in the environmental assessments in relationship to botanical surveys. Finally, the reassessment of the survey boundaries lines for the fauna monitoring provided checks on the boundary survey points.



Work on the north part of the reserve resulted in the extension of the control point system to the north up to the northern boundary.

Survey work to the east resulted in the expansion of the control points between Nohol and Xaman Pilar on the east and Pilar Poniente and Kum in the west. Both in the north and in the east, ancient Maya settlement, status of the vegetation, topographic relief, and other features were documented.

One of the major concerns for data collection in the reserve is the quality of the control point system. Over the past several years we have developed methods for the expansion of the control point system and have been successful in using a combination of strategies that provide coverage for the current research in cultural and natural resources of El Pilar.

Five control points were set out this season. They were concentrated on Transect A2. Two control points were fixed between Nohol Pilar and Pilar Poniente (A2-19 and A2-20). The other three were located at Pilar Poniente (PP1, PP2 and PP3).

Control Points	**Northing**	**Easting**	**Elevation**
A2-19	1908717.484	271375.038	213.784
A2-20	1908717.560	271349.658	213.717
PP1	1908645.952	270857.813	230.587
PP2	1908612.703	270864.990	231.049
PP3	1908576.856	270843.354	229.367

One GPS point was also taken at Kum (site 13-6-A). The northwestern corner of the platform south of the northern aguada has the UTM coordinates: Northing 1910768 and Easting 269462. This was used to locate the whole complex within the UTM grid.

Our final work was associated with the review of the reserve limits, the clearing of the boundary line, and the development of a resource monitoring design with the assistance and support of Roan McNabb and the trained monitoring crew from Uaxactun. The El Pilar boundary clearing was an arduous job undertaken in the last part of the season and with the direct support of the Department of Archaeology. Every year from 1996 through 1999, the BRASS/El Pilar team included the boundary brecha clearing as part of the field season's work. In 2000, the Department of Archaeology took over the job, and in 2001 we jointly worked to make the boundaries of El Pilar clear and well delimited. This is a critical part of the management of the reserve and the vast resources within it.

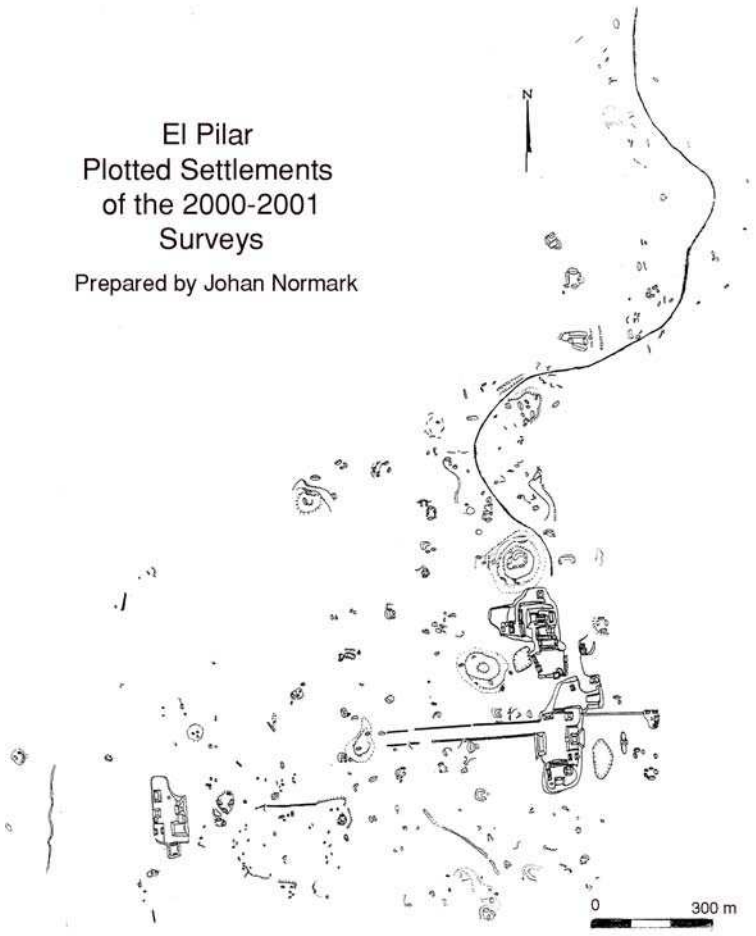
The boundaries of El Pilar cross over a wide variety of environmental zones and serve as a means of monitoring more than just incursions and infractions. Once the southern boundary was cleared, we worked with Roan McNabb Wildlife Conservation Society to train Amigos de El Pilar in the monitoring protocols for faunal surveys. The phasing of the monitoring training on the boundaries with the training of the El Pilar crew in the monitoring protocols was successful. The south boundary was selected, as it is accessible, most threatened with incursions, and crosses a variety of resource zones representative of El Pilar. There are hills, streams, tall canopy, and regenerating forests. In addition, there were new burned areas identified within the reserve boundaries. Amigo de El Pilar members easily recognize plant and animals communities that are associated with these distinct vegetation zones. The Uaxactun crew was able to experience a new area, work with fellow campesinos, and demonstrate techniques for the El Pilar program and the Amigos de El Pilar. We now have a monitoring strategy based on the baseline transect of the south boundary line of the El Pilar Archaeological Reserve for Maya Flora and Fauna.

Survey Coverage

The El Pilar Archaeological Reserve for Maya Flora and Fauna incorporates about 2000 hectares total, embracing the city core of El Pilar. From previous survey efforts, we have identified the presence of large architectural features across this protected area. Temple complexes of varying sizes have been found within the boundaries of the reserve. The past two years work on the development of the archaeological survey, inventory, and analyses has provided a base for gathering an inventory of cultural remains for management and for research. While it will take some years to create the full inventory for the reserve, we now have an established system for survey coverage, mapping conventions for documentation, and a control point propagation design to further the work. This survey strategy will provide documentation for the cultural inventories as well as a means for working with the environmental inventories.

This season, with the established survey system, we were able to cover more than 120 hectares. Combined with the 30 hectares covered in 2000, we have been able to cover a total of more than 150 hectares. This coverage is less than 10% of the 2000-hectare reserve, but we have been in the experimental phase of the work. This initial phase has provided a basis for understanding the methods and techniques for developing the long-range strategies needed to complete the survey.

In general, the ancient Maya settlement seems to cluster where there is topographic relief. Low lying and flat areas that experience inundation during the rainy season did not attract many prehistoric settlers. The lower lands have sparse evidence of settlement. This is not surprising as the average rainfall from June through December is 2000 mm.



Hill slopes rising from the low areas appear to be devoted to limestone quarrying. Quarries are a dominant feature of the area, and this certainly relates to the long period of construction at the monuments of El Pilar beginning around 500 BC and culminating in the Terminal Classic Period from 900-1000AD. In the final centuries of expansion, El Pilar covered nearly 50 hectares in public architecture with major civic plazas, restricted private rooms, and dramatic causeways. Throughout this whole sequence there is evidence of monumental construction, façade plastering, and plaza amplification. All this involved limestone building blocks, construction fill, and lime for mortar and stucco.

Around the monuments, the residential component of the Maya spread respecting the topographic assets and limitations. Households large and small characterized the city inhabitant's residences. Superficial evidence from the fieldwork suggests that there are many residential units of considerable size, comparable to those found around Tikal. In addition, there appears to be the presence of minor centers, such as Kum in the west and Chorro in the east, all within a 3-km radius of the main core of El Pilar.

Kum is a minor center, 3 km northwest of Plaza Copal, and 2.5 km from Pilar Poniente. It was originally sketch mapped in 1998. This year we made some additions to

the map, clarifying features and modifying structures. There are several house mounds to the west. We could not verify the ramp/causeway that is indicated on the earlier map. We established one GPS reading from the site to fix it to the UTM grid.

Mapped residential units are presently scheduled to be analyzed and labor investments determined for comparison with the greater BRASS surveys of the 1980s. In addition, comparisons will be made with Tikal and the rural settlement between Tikal and Yaxha to assess compositional similarities, wealth distribution, and patterns of compounds. These wider comparative analyses will help to bring the urban qualities of the Maya at El Pilar into the context of the Maya forest developments.

The density of the residential sites is high, from 200-300 structures per square kilometer. This density is comparable to those of other major centers in the Maya region. The settlement density varies across the landscape of El Pilar. The density between the major architectural components of the east and west El Pilar is relatively high. Density drops of markedly to the west of Pilar Poniente. A few large plazuela groups dominate the area to the west, but most of the area has few remains.

We also had time to update the map of Pilar Poniente. We added several lower structures near the monumental core area as well as a several chultuns, all within the main plaza area. The looter's trench that penetrates the main eastern winged structure, PP1, has been investigated, and the exposed building sequence identified.

Parapets and Water Management

Of critical importance in this tropical environment is the access to drinking water during the dry season. Dispersed across the landscape surrounding El Pilar are water impoundment devices called aguadas and storage areas know as chultuns. The aguadas undoubtedly functioned as water reservoirs. They regularly occur in low areas where drainage is directed and are often in clay-soil areas that retain surface water. The function of the chultuns has been seen as problematic and has received much attention in the literature over the past decades. Normally carved into the limestone, the chultuns of El Pilar, similar to those of the greater Peten, are in areas near and between settlements. They are not lined nor have evidence of plaster. Often there are capstones nearby revealing that they were covered if not sealed. These have been assumed to be for dry storage, as water would not be retained through the porous limestone.

In the course of the survey and associated with the topographic survey, we located several dry channels around El Pilar. These channels clearly carry water and lead us to question the nature of these features. Whether they are natural or constructed ditches or channels for water cannot be determined at this moment. One of these channels is particular deep, over three meters, and runs along the foot of a hill that is west of Pilar Poniente. This channel is directly associated with a spring and has been maltreated by repeated clearings that have subsequently dried up the surface water. Some of the channels found in the survey lead to and through linear walls features we have called parapets.

One channel is associated with Bryan & Murphy Causeway. There is a break in the causeway wall at the point where the channel crosses the causeway. The breaks in the parapets of the causeway allow for water flow across the causeway from the southeast since the terrain is higher to the southeast slopes gradually down to the northwest. Where the causeway reaches its lowest point, the channel exposes stone. The creek bed disappears and we suspect that the water moves in a subterranean channel from that point on towards Labouring Creek. To the west of this channel is the base of a low and heavily quarried hill. The Bryan & Murphy Causeway parapets continue up the slope. The southern parapet seems to end (or start, depending on your perspective) in this quarried slope. The end of the northern parapet is more interesting. A few meters west of this northern parapet is a large looted mound that is contiguous with the parapet, apparently in line with the wall. Farther west of this looted structure is the quarried hillside that abuts the south parapet of the causeway 30 meters away.

There had been indications of a second causeway offset and continuing west from the Bryan & Murphy Causeway on the Chikin side of El Pilar. This linear feature appears to have only one parapet and, while sufficiently wide to allow for a walkway, and differs from the Bryan & Murphy promenade. The Chikin feature consists only of one parapet of 125 m in length, with an extended platform on its eastern end that sits south of the terminus of the Bryan & Murphy Causeway. This parapet also goes in an east-west direction but is not as direct as the causeway from Nohol Pilar. The Poniente Causeway has two breaks very close to each other. The westernmost of these breaks is at the foot of a hill that supports a large cluster of structures in a plaza group. At the parapet break, there is a creek bed running that may have directed water from the top of the hill. Whether the parapet is just one narrow raised causeway or if it was a wall-aligned causeway under construction requires more investigation to determine.

A third and fourth parapet identified in this year s survey differ from the others. These parapets are relatively short, 35 and 50 m long, and they run in north-south direction. Both of these features are on flat ground and are about 0.5 m high. These straight alignments are similar to feature seen north of Transect N16W. These features are curvilinear alignments of 20-30 m in length that could be walks, drainage directors, or simply piles of rock from clearings of agricultural activities. Similar feature have been noted elsewhere in the El Pilar surveys at Laton, 4.5 km south on the El Pilar transect, and near Kum where a very low, 30 m long alignment was identified.

These causeways, parapets, and alignments are unusual features that are not reported anywhere in the literature on ancient Maya settlement surveys, but are distinct features of the El Pilar landscape. While the obvious causeway demonstrates interest in linking the residential components to the civic and public architecture, the curvilinear features are more obscure. These features are clearly related to the residential domain and consequently of domestic importance. Since they do not seem to separate households, divide terrain, or connect groups, their functions are not clear. As we continue the surveys, launch the test excavations, and better understand the features of the El Pilar landscape, the features will reveal their purpose.

THE MONUMENTAL CORE AREA: DISCOERING EL PILAR

Cultural heritage conservation combined with visitor access has been a dominant theme of the work at the monumental core of El Pilar. Our work of the 2001 season consisted of structure stabilization, access evaluation, trail management, and forest garden development. The work was divided between various charges. All ancient architectural resource exposure, conservation, and stabilization were under the explicit direction of Rudy Larios. Trail management fell to Eduardo Gonzalez along with the Amigos de El Pilar. The Forest Garden team was lead by Heriberto Cocom, president of Amigos de El Pilar. This remarkable collaboration resulted in the completion of the initial investigations of EP7 of Plaza Copal in the south, the continued development of Plaza Jobo in the north, the creative presentation of the site at the Fiesta El Pilar 2001, and the publication of the Tzunu'un Maya Forest Trail Guide.

Majestic XikNa EP7 of Plaza Copal

Our objectives at EP7 were to reveal the winged temple façade and to identify features that would typify the building for exposure in the future. This project involved several facets:

1. Fabrication of a retention wall in the extreme west of the tunnel and below the final stair of the Late Classic Period to give structural strength to the consolidation and eliminate the entrance to the tunnel form the Plaza side.
2. Develop a stable fill in the 2 by 2 meter test pit in front of the stair that gave access to the tunnel and to cover the entire refilled pit and stain with screened earth to protect the architectural features for later development.
3. Prepare a plan and profile of the architectural features, along with the projected costs of judicious exposures for view from the plaza area.

Plaza Copal as Seen Today and Imagining the Future

To begin the work at Plaza Copal, we initiated a transit survey of the excavation and tied this into the existing control points on the Plaza. These set the stage for the plan and profile preparation as well as the retaining wall construction that would eliminate the west entrance into the excavation tunnel. Efforts were made to create a solid wall for the tunnel while at the same time considering the issues of water

percolation and air circulation. We installed PVC tubes in the wall for air that can be closed while unoccupied and opened for continued work within the tunnel. When the conservation work was complete, the old thatched champa that had protected the open stairs was removed and the area was left open to be enjoyed from the sheltering tree in overhead. Our estimates to open and consolidate exposures under the canopy of the trees are presented in Appendix II.

The Labyrinth at Plaza Jobo

The investigations of Plaza Jobo have presented great tests to our hypotheses of the complex architecture of the H'Mena Acropolis of the northern portion of El Pilar. In 1996, our first tests into the area were intended to devise a protection for an exposed corbel and to identify the stairway to the highest temple of El Pilar. This effort revealed a beautiful room in structure 22 and several other rooms where we had thought a stair would be. Stabilization of the architecture took several more years with a large lamina roofed area and consolidated walls below. Our objective for 2001 was to open what we hypothesized was the principal entrance into the patio area of Jobo so that visitors to could gain an appreciation for the unique enclosure. These attempts were thwarted not for our own efforts but for those of the Maya. Entrance into the Jobo Labyrinth was not an easy matter as our excavations of the 2001 season reveal.

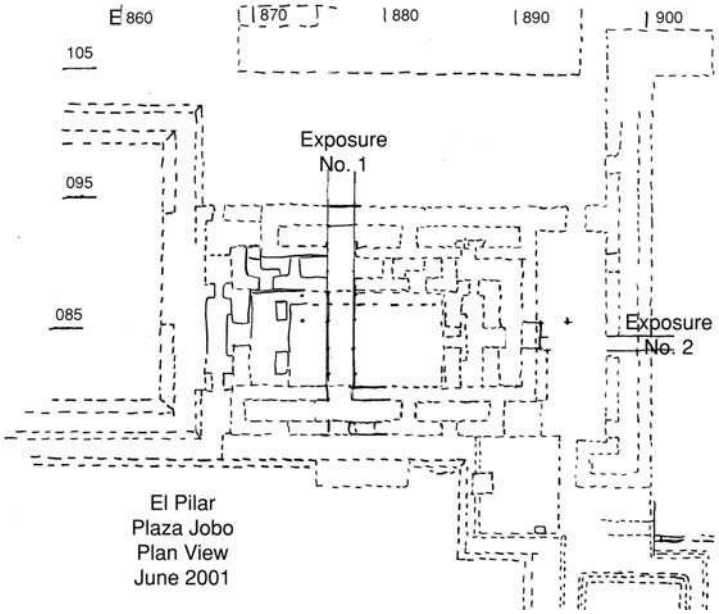
Examining Entrances: Exposing the Complexity of Jobo

Experience with Maya construction in general, and the nature of accesses identified around El Pilar in specific, suggested that the main entrance into the Plaza Jobo was through the northern area between two prominent buildings. We set up the excavation grid based on the control points N14 and N7.

Control Points:	N14=	N.1909106.909	E. 271886.931, H. 234.772
	N7=	N1909123.447	E. 271679.148, H. 225.775

The procedures of the BRASS/El Pilar Program have been consistently developed and standardized for comparability from year to year. All unit levels were excavated following natural stratigraphic levels wherever possible using hand tools (wrecking bar, shovel, pick, pick-a-hoe and trowel) and screened through a 1/2" wire-mesh screen. All lithic and ceramic artifacts larger than a Belizean quarter were kept for analysis. Any special artifacts, such as obsidian prismatic blades, bone, and shell pieces were retained no matter what size when recovered. Charcoal samples were taken when the quantities would be enough for accurate radiocarbon analysis. Strata were defined in terms of soil type (i.e., sandy, loam, etc. from the PCA Soil Primer), dry soil color (with a Munsell Soil Color Chart), and size, type and percentage of inclusions (sizes range from boulders, cobbles, gravel and pebbles; and type generally ranged from limestone to chert).

Over the course of the work at Plaza Jobo, we incorporated both field crew of the BRASS program and community participants from Amigos de El Pilar. The excavations proceeded as per our established methodology and no major problems were experience during the fieldwork. Architectural features of doors, walls, floors and benches were encountered in their logical situation. The surprise that presented itself was that we were unable to verify the entrance into the patio area. We began with the north and immediately noted that the north wall precluded entrance from Manax. We then examined the potential of an entrance from Kibix with the same results. Finally, a restricted test to the south was made with the discovery of a sealed access.



The exposure design for the fist excavation area included the layout of a 2 by 18 meter area that would be cleared of the collapse to identify the architectural features. We hypothesized that the central building doorway went from the north through the building into the plaza. We intended to remove the collapse between the new exposure and the consolidated sections to insure the safety of the walls. In addition, since we had recovered mosaics in the patio area, we anticipated that we would encounter more mosaics as we cleared the interior area. The exposure layout was as follows:

Exposure N-S: E. 271876.00 and E. 271878.00

Initiated in the N: N. 190098.00
Ended in the S: N. 190080.00

The work revealed a wall on the north impeding access from the north into the Jobo area. The wall was in particularly bad shape and gave the appearance of having been partially dismantled in the past. The rooms of this building presented themselves in sequence with a back room and bench accessed from the patio through an anteroom. At each room the level of the floor rose into benches each higher that the preceding one.

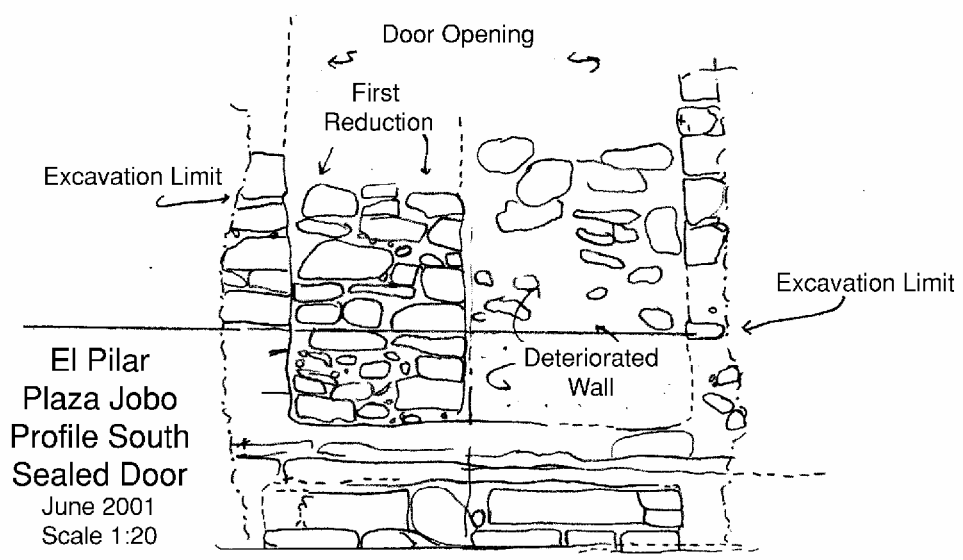
With the absence of a passageway from the north, we deliberated as to the next steps given the nature of the enclosure of Jobo and the more natural ways one might expect to enter. We set up a second examination on the East, outside the plaza to investigate the evidence for a doorway and entrance into Jobo. The second layout was situated as follows:

Exposure E-W: N. 1909084.00 and N. 1909086.00

Initiated: E. 271896.00
Ended: E 271879.00

The result of the eastern examination was the same: there was no door on the east that would permit entrance from that direction. The wall was in bad conditions and while the masonry was of good quality, only the last two moldings remained in tact.

With still some hope of central access-ways into the Jobo area, we turned to the south and began a tentative exposure in that direction. Here we hoped to encounter a doorway that would have permitted the exit from the patio. Continuing on the axis of the first exposure excavation, we did encounter a door that, for a moment provided a clue to access. With careful examination, it became clear that the doorway was initially narrowed and ultimately sealed completely with stone. This canceled any possibility to enter or leave from this door, at least in its final stages.



After these simple examinations for the entrance to Plaza Jobo, we are still without an answer. Yet, we do have more knowledge of the Plaza Jobo. First, no entrance to Jobo was oriented in the centers of the patio enclosure. Second, privacy was of prime importance for the area. Finally, gaining entrance to the area was restricted and by no means an easy matter. Several potential avenues for investigation present themselves. There is an unusual depression in the SE of the patio that could be an access way from that angle. Another possibility is that of a secret entrance in the west associated with interior rooms out to Plaza Manax. Finally, we might consider access to the south in another area of the patio.

Locating the access to Jobo will require major excavation and consequently major resources for the investigation and subsequent stabilization. The patio and its buildings are well conserved and worth the effort for display. They will, however, need substantial investments in consolidation based on the careful exposure and excavation of the space.

Interpreting the Architecture

The exposures of Plaza Jobo have helped to illuminate new details of the constructions of the patio area. As with all long-term construction projects, the enclosure of Jobo was a process of remodeling and the work of this year has helped us understand at least a part of that history. At this point in our work at this area, we have exposed about 50% of Str 20 and 25% of Str 22. In addition, we have gained some insights into the other buildings of the space.

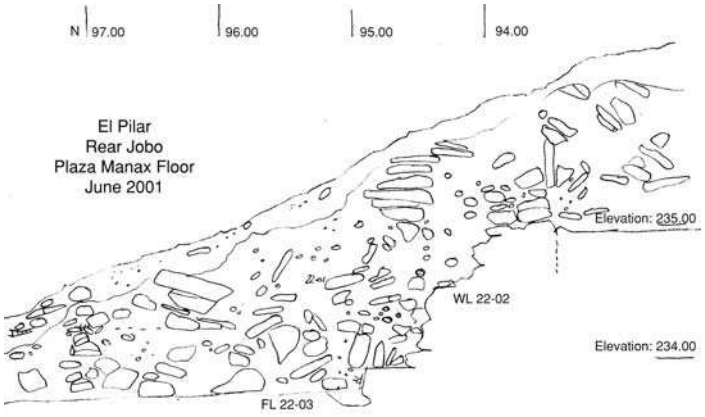
As we were aware, Str 22 experienced many remodelings as reflected in its masonry. In one part, the masonry is of well-shaped large and uniform blocks that are only found in the rear and north wall. We now associate this bearing wall with the central wall of the structure exposed in the current excavations. It seen is that the original structure was constructed to divide plazas Manax and Jobo. This main structure was remodeled with additions to the front and side, changing the original facade of the early building to interior walls of later building. The result is a fully integrated building that has as its central block a fine block building.

The later additions to the main building were accomplished in an distinct masonry style using small stones and a somewhat casual construction. Since all this was ultimately covered with stucco, the original masonry would not have been visually important.

Modifications of the interior spaces were also ongoing over the course of the use of this area. The northern room is the oldest component of the exposure and has a bench at the back. The form could be an L, such as the one inside on the west, a U, or even occupy the entire rear of the room. Later, when the room to the south was integrated into the structure, another lower bench was added, making the rise to the rear bench by a small step. Later the lower bench was extended into the new room to the south. The entire façade of the building has a basal molding for the foundation and a wide terrace before the step into the patio.

The floor of the patio of Jobo is one that extends beneath the floors of the rooms on the north. The same patio level is encountered on the floor in Plaza Manax. While we cannot say with complete certainty it is one and the same, construction strategies of the Maya would require the sealing of the main floor before the construction of the first building. It was not possible to define the same aspect to the north, but it should be encountered when more completely excavated.

Our investigation of Plaza Jobo is still incomplete and leaves much open to question. Nevertheless, it is clear that the first structure was the northernmost building Str 22. We suspect that Str 21 is contemporaneous based on the masonry. The next



phase of constructions were the modification of Str 22 that integrated Str 20 at the extreme west. Finally, the piers were added and the façade with the mosaics was established. The outside and north wall of Str 22 is in an unusual state of damage. Only the final rows of the facing stones are visible. All the façade portions of the wall appear to have been removed before collapse. The full wall may have been standing as we encountered vault stones in the collapse. It would appear that there was some recycling of materials before the collapse. Given the state of this wall, consolidation would involve a significant investment in complements to maintain the wall structure in stable condition.

MANAGEMENT AND DEVELOPMENT

The El Pilar Program evolved from an archaeological base examining ecological relationships of the Maya forest. Today, the Program represents a team of local community leaders, regional non-government organizations, national governments, and academic researchers seeking new ways to build a conservation model. The focus is at El Pilar, a newly declared contiguous park spanning the political divide of Belize-Guatemala. As a protected area, El Pilar provides an educational laboratory with potential to reach the immediate community, local students, regional visitors and supporters, as well as international tourists and scholars. To this end, the 2001 field season collaborated with Amigos de El Pilar, Help for Progress, Mesoamerican Biological Corridors, and the Maya Forest Coalition to establish new ways of supporting heritage conservation in the Maya forest.

Several significant management events were part of our work this year. First, there was the presentation of the Strategic Plan for El Pilar. This presentation occurred in March of 2001 in Cayo, Belize and involved the collaboration of Amigos de El Pilar from Belize and Guatemala. The Strategic Plan for El Pilar underscores the objectives and the activities for the partnership at El Pilar to work and delineates with a time line for the expectations. Next, there was the Fiesta El Pilar that drew several thousand visitors to El Pilar. Amigos de El Pilar and Help for Progress promoted the Fiesta with support from BRASS/El Pilar. Preparation of the site and coordinating on-site security were a major issues. Parking and vehicular traffic are a serious concern for the fauna of the site. Different designs will need to be evaluated for subsequent fiestas. Finally, and most importantly, the Consultative Council El Pilar CoCEP was formed as an advisory board to the management process for El Pilar. The design of the CoCEP is to emphasize regional tourism focused on adventures. There are representatives from the private sector, NGO, government, community science and education on the board. While new,

the role of CoCEP can be important in the long-term development of El Pilar and the promotion of the El Pilar Model for the future (Appendix III & IV).

Over the course of the field season, it is customary for the program team to undertake several projects involving the reserve infrastructure. This year several projects were undertaken to improve the site. Main trailhead signs and guideposts were painted for clear visibility. Trails were improved over all, paths and stairs were replaced, and champas repaired. The champa over the EP7 stairs was removed as it was in very bad condition and, with the consolidation of the excavation pit, we were able to replace a protective mantle of earth over the plaster stairs to eliminate erosion and damage. Protective roofs over rest stops were replaced and rest stops enhanced for visitor comfort. The Duende picnic area was cleaned and the roof checked for leaks. Other areas of trails were improved and maintained.

These are activities that may often go unnoticed, but are part of a real interest and contribution of the El Pilar Program to the management of the public visiting areas as well as support area of the caretakers. While working with the El Pilar care taking staff, new issues are discussed and solutions explored. Concerns voiced by Amigos de El Pilar and the caretakers are important aspects of the community participation in the responsibilities and benefits of El Pilar.

In addition to the regular maintenance, we teamed up with the Department of Archaeology and conducted a major clearing of the park perimeter eliminating the brush, removing stumps, exposing the survey markers, and generally making the boundaries visible for the local area land owners and visitors alike. In addition, the southern boundary is now proposed as a fauna monitoring station.

Finally, two trail guides for El Pilar have been finalized for the Tzunu'un forest garden and for all the trails of El Pilar. The written components of these two projects have been complete for several years awaiting publication. In an innovative collaboration with Help for Progress and with support from PACT, we have published the Tzunu'un Maya Forest Garden Trail Guide and have the composition and layout for the Trails of El Pilar: A Comprehensive Guide. These trail guides are prepared with the visitor in mind and are designed to direct visitors to the unique qualities of El Pilar and the Amigos de El Pilar.

Appendix I
El Pilar Control Points List
UTM 16N WGS84

Wm. Clay Poe, Ph.D., RPA
Professor of Archaeology
Sonoma State University

Point Number	Northing	Easting	Elevation	Latitude	Longitude
A2	1908717.574	271850.516	235.608	N 17°15'07.75909"	W 89°08'45.11612"
A3	1908685.288	271864.896	240.206	N 17°15'06.71437"	W 89°08'44.61733"
A5	1908665.352	271832.834	233.928	N 17°15'06.05449"	W 89°08'45.69488"
A6	1908659.736	271908.430	240.172	N 17°15'05.89918"	W 89°08'43.13440"
A9	1908648.885	271852.188	239.777	N 17°15'05.52600"	W 89°08'45.03369"
Base_1998	1908281.154	272068.782	239.397	N 17°14'53.64611"	W 89°08'37.56547"
BL_BM	1908906.088	271946.256	230.412	N 17°15'13.92390"	W 89°08'41.94689"
C1	1908861.362	271949.930	232.273	N 17°15'12.47080"	W 89°08'41.80575"
C3	1908747.868	271958.411	229.292	N 17°15'08.78317"	W 89°08'41.47604"
C5	1908733.328	271882.663	236.101	N 17°15'08.28298"	W 89°08'44.03409"
C6	1908831.115	271888.265	236.100	N 17°15'11.46491"	W 89°08'43.88129"
C7	1908904.444	271924.002	229.217	N 17°15'13.86238"	W 89°08'42.69940"
C8	1908913.547	271921.917	230.073	N 17°15'14.15767"	W 89°08'42.77340"
E10	1908535.366	272063.892	226.504	N 17°15'01.91099"	W 89°08'37.82644"
E10	1908535.285	272063.793	230.583	N 17°15'01.90831"	W 89°08'37.82977"
EPB1	1908278.684	272071.339	239.372	N 17°14'53.56671"	W 89°08'37.47802"
F1	1908972.006	271899.210	221.422	N 17°15'16.05045"	W 89°08'43.56387"
F2	1908979.523	271861.520	220.013	N 17°15'16.28127"	W 89°08'44.84223"
GPS01T	1908500.247	272056.022	227.989	N 17°15'00.76614"	W 89°08'38.07960"
I3	1909066.551	271895.816	234.076	N 17°15'19.12370"	W 89°08'43.71426"
L1	1909146.113	271843.269	221.638	N 17°15'21.69196"	W 89°08'45.52255"
L2	1909139.570	271818.399	221.797	N 17°15'21.47019"	W 89°08'46.36179"
MB	1908765.846	271906.837	236.456	N 17°15'09.34916"	W 89°08'43.22823"
N01WCP2	1909259.611	271835.329	227.719	N 17°15'25.37988"	W 89°08'45.83399"
N1	1908933.124	271887.843	223.882	N 17°15'14.78194"	W 89°08'43.93393"
N10	1909001.001	271890.673	221.576	N 17°15'16.99025"	W 89°08'43.86368"
N11	1909018.879	271887.479	225.329	N 17°15'17.57045"	W 89°08'43.97849"
N14	1909106.808	271886.931	234.772	N 17°15'20.42958"	W 89°08'44.03011"

N16WCP1	1909466.052	271697.595	203.917	N 17°15'32.04325"	W 89°08'50.57310"
N16WCP2	1909468.404	271650.269	199.811	N 17°15'32.10260"	W 89°08'52.17568"
N2	1908963.325	271936.381	222.408	N 17°15'15.78160"	W 89°08'42.30261"
N21ECP1	1909567.729	271790.734	203.473	N 17°15'35.38332"	W 89°08'47.45919"
N24ECP1	1909602.341	271819.640	204.196	N 17°15'36.51930"	W 89°08'46.49392"
N29ECP1	1909684.880	271832.043	201.047	N 17°15'39.20785"	W 89°08'46.10522"
N33WCP1	1909722.671	271804.426	196.957	N 17°15'40.42678"	W 89°08'47.05410"
N39AWCP1	1909824.343	271983.282	175.798	N 17°15'43.79767"	W 89°08'41.03911"
N39AWCP2	1909869.310	271961.683	175.036	N 17°15'45.25211"	W 89°08'41.78701"
N39AWCP3	1909919.463	271951.218	172.696	N 17°15'46.87922"	W 89°08'42.16006"
N4	1909056.568	271834.948	223.543	N 17°15'18.77707"	W 89°08'45.77050"
N5	1909097.699	271824.189	224.356	N 17°15'20.11069"	W 89°08'46.15007"
N7	1909123.447	271879.148	225.775	N 17°15'20.96785"	W 89°08'44.29977"
N79WCP1	1910491.664	271955.591	158.059	N 17°16'05.48798"	W 89°08'42.22737"
N83WCP1	1910547.746	271995.146	150.882	N 17°16'07.32600"	W 89°08'40.90970"
NB	1908763.220	271862.426	236.380	N 17°15'09.24772"	W 89°08'44.73022"
NW	1911267.472	268090.226	180.392	N 17°16'29.30616"	W 89°10'53.34789"
POS1	1908507.356	272081.488	226.186	N 17°15'01.00650"	W 89°08'37.22043"
POS2	1908515.820	272045.094	226.042	N 17°15'01.26858"	W 89°08'38.45527"
POS3	1908424.545	272041.392	227.894	N 17°14'58.29910"	W 89°08'38.54626"
POS4	1908294.579	272015.913	230.543	N 17°14'54.06360"	W 89°08'39.35971"
POS5	1908292.262	272067.262	237.577	N 17°14'54.00678"	W 89°08'37.62108"
RP01	1908762.474	271965.320	229.213	N 17°15'09.26063"	W 89°08'41.24772"
SBM1	1907392.761	272010.406	261.007	N 17°14'24.73569"	W 89°08'39.20733"
SW	1907433.106	268008.538	208.925	N 17°14'24.59088"	W 89°10'54.64585"
T1	1909117.046	271818.151	224.999	N 17°15'20.73766"	W 89°08'46.36172"
T10	1908574.166	272016.792	228.689	N 17°15'03.15571"	W 89°08'39.43499"
T11	1908623.598	271957.563	224.639	N 17°15'04.74178"	W 89°08'41.45804"
T12	1908659.651	271943.204	229.345	N 17°15'05.90899"	W 89°08'41.95752"
T13	1908694.288	271927.242	234.999	N 17°15'07.02956"	W 89°08'42.51076"
T14	1908710.648	271907.140	237.243	N 17°15'07.55433"	W 89°08'43.19721"
T15	1908696.785	271881.962	241.742	N 17°15'07.09440"	W 89°08'44.04406"
T16	1908880.648	271914.428	230.490	N 17°15'13.08511"	W 89°08'43.01449"
T17	1908924.770	271975.794	221.855	N 17°15'14.54206"	W 89°08'40.95426"
T18	1908928.674	271913.330	225.853	N 17°15'14.64645"	W 89°08'43.06971"
T19	1908842.398	271996.629	227.201	N 17°15'11.87098"	W 89°08'40.21817"
T2	1909056.393	271829.708	223.337	N 17°15'18.76947"	W 89°08'45.94774"
T20	1908777.306	272000.376	226.269	N 17°15'09.75563"	W 89°08'40.06692"

T21	1908687.500	272044.520	225.868	N 17°15'06.85120"	W 89°08'38.53922"
T22	1908576.780	272049.065	227.516	N 17°15'03.25237"	W 89°08'38.34380"
T23	1908610.058	272085.447	227.253	N 17°15'04.34767"	W 89°08'37.12504"
T24	1908630.945	272088.789	231.527	N 17°15'05.02808"	W 89°08'37.01977"
T25	1908663.706	271869.297	241.761	N 17°15'06.01416"	W 89°08'44.46027"
T26	1908676.929	271920.092	240.101	N 17°15'06.46250"	W 89°08'42.74621"
T3	1909041.321	271838.725	223.028	N 17°15'18.28261"	W 89°08'45.63693"
T4	1909007.719	271843.854	219.644	N 17°15'17.19178"	W 89°08'45.45070"
T5	1908971.056	271929.630	223.549	N 17°15'16.03056"	W 89°08'42.53400"
T6	1909010.635	271886.403	225.338	N 17°15'17.30199"	W 89°08'44.01181"
T7	1909039.082	271873.287	229.711	N 17°15'18.22231"	W 89°08'44.46640"
TN10	1908668.908	272081.888	227.915	N 17°15'06.26010"	W 89°08'37.26761"
TN5	1908668.587	272096.401	231.396	N 17°15'06.25490"	W 89°08'36.77632"
TN8	1908658.716	272120.174	231.200	N 17°15'05.94248"	W 89°08'35.96806"
VC1	1908335.694	271996.177	233.021	N 17°14'55.39349"	W 89°08'40.04306"

Appendix II
Critical Conservation Areas

Estimates are for the consolidation of exposures and do not include costs associated with investigation or excavation of exposures. All estimates are in US Dollars.

El Pilar Restoration Proposals

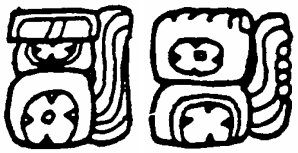
Str. 25		No.	Time/days	Cost
	Masons	4	120	$14,400.00
	Laborers	8	120	$19,200.00
	Lime	180		$1,260.00
	Cement	39		$565.50
Total				$35,425.50
Str. 53/22				
	Masons	4	120	$14,400.00
	Laborers	8	120	$19,200.00
	Lime	90		$630.00
	Cement	24		$348.00
Total				$34,578.00
Str. 19				
	Masons	2	80	$4,800.00
	Laborers	4	80	$6,400.00
	Lime	45		$315.00
	Cement	11		$159.50
Total				$11,674.50
Faisan/Gumbo				
	Masons	4	120	$14,400.00
	Laborers	8	120	$19,200.00
	Lime	90		$630.00
	Cement	23		$333.50
Total				$34,563.50
Str. EP3				
	Masons	4	120	$14,400.00
	Laborers	8	120	$19,200.00
	Lime	90		$630.00
	Cement	21		$304.50
Total				$34,534.50

Str. EP7						
	Masons	**8**	**120**	**$28,800.00**		
	Laborers	**16**	**120**	**$38,400.00**		
	Lime	**360**		**$2,520.00**		
	Cement	**77**		**$1,116.50**		
Total				**$70,836.50**		
Str. EP10						
	Masons	8	120	$28,800.00		
	Laborers	16	120	$38,400.00		
	Lime	360		$2,520.00		
	Cement	77		$1,116.50		
Total				$70,836.50		
SUMMARY BUDGET						
	Masons			$120,000.00		
	Laborers			$160,000.00		
	Lime			$8,505.00		
	Cement			$3,944.00		
	Tools			$9,410.00		
	TOTAL		BZ$	$301,859.00	US$	$150,929.50

Assumptions:
1. All salaries figured at an average of 20 working days per month
2. Abaniles (master masons) at BZ$30/day
3. Mason's assistants and general labor at BZ$20/day
4. Lime at BZ$7/bag
5. Cement (both portland and white) at BZ$14.5/bag
6. Wheelbarrows at BZ$140/ea
7. Mason’s tools (made by AMS) and trowels at BZ$20/ea
8. 5 gal buckets at BZ$5/ea
9. Tambos (55 gal drum) at BZ$25/ea
10. Assumes sascab and filler stone brought in by the Ministry of Works at no cost

Appendix III

Consultative Council El Pilar



Lakin ~ Chikin
One Initiative for El Pilar in the Maya forest

International Coordination –
Consultative Council El Pilar

Establishment of the Consultative Council El Pilar

Objectives: To support appropriate mechanisms to coordinate and manage research, tourism, and other activities at the El Pilar Archaeological Reserve for Maya Flora and Fauna between Belize and Guatemala via the Consultative Council El Pilar (CoCEP)

El Pilar International Management Goals:

a) To establish the participation of the Consultation Council for El Pilar ~ CoCEP
b) To promote joint cooperation in the strategic management of El Pilar via CoCEP
c) To activate CoCEP in annual meetings and periodic monitoring of joint efforts
d) To foster inter-agency management designs within and between countries of the Maya forest
e) To build a innovative financial basis base using local, regional, and international networks

Activities for CoCEP

a) Informal technical exchanges with CoCEP
b) Secure a Carta de Intención for general cooperation between the relevant government agencies
c) Support paired connections: Department of Forestry – CONAP, Department of Archaeology – IDAEH, Immigration and Customs
d) Promote cooperative CoCEP under the jurisdiction of each management entity
e) Develop and implement joint management strategy with CoCEP
f) Formal agreement for cultural exchange (UNESCO, Embassies)
g) Prepare appropriate delegation agreements and statutory instruments

International Relations

(a) The Government, via the Ministry of Foreign Affairs, is the only governmental entity that may sign agreements at the national or political level.
(b) The Department of Archaeology, Ministry of Tourism, through the Commissioner of Archaeology is the entity that may sign agreements between institutions with regional or international objectives
(c) Protected areas alone may sign letters of understanding with other protected areas at the international level

Financial

Objectives: To develop a sustainable and manageable funding basis for the EPAR developing a network of local, regional, and international donors from public and private sector to development and enhance a growing EPAR trust fund)

Conflict Management and Enforcement

Objective: To be able to manage conflicts within the reserve administration between the reserve and the communities and between the two nations

Activities to monitor

(a) Create a protocol for conflict resolution
(b) Promote CoCEP as a management oversight

Research and Monitoring Program for EPAR and the Maya forest

General Objectives: Research, Education, Conservation, Protection

(a) To focus on nexus of culture and nature
(b) To promote solicited and independent science projects that creatively consider culture and nature Standardized data collection maintain highest standards by reviews within CoCEP
(a) To develop a comprehensive Geographic Information System (GIS) for the EPAR jointly with the Maya Forest Coalition that incorporates the scientific data collected at EPAR
(b) To maintain membership in Conservation and Environmental Data Systems (CEDS) for data sharing, GIS archiving, and management modeling for cultural and natural resources
(d) To organize an El Pilar research committee made up of research scientists working in the area to coordinate with CoCEP

I. Administration – Formal/International Relations Locally, Regionally, Internationally

General Objectives

(a) To establish a strong administrative/management presence at the EPAR
(b) To support the creation of CoCEP for regional planning at EPAR
(c) To develop the co-management strategy from DoA to NGO/CBO (see section VIII)

Non-Delegable Authority in the hands of Government

(a) Enforcement
(b) Research Approvals
(c) Review and Application of Management Plan and Amendments

Consultative Council for El Pilar (CoCEP)

Description of CoCEP

Knowledge of the resources of the EPAR
Commitment to resource management and conservation
Liaison between management and community

Belize	Guatemala
Village Council member	Municipality member
AdEP member	AdEP member
NGO member	NGO member
DOA member	IDAEH member
Forestry Member	CONAP member
BTB/BTIA member	INGUAT Member
University member	University member
El Pilar Program	El Pilar Program
Required CoCEP Meetings	Required CoCEP Meetings
Ad hoc Informal Liaisons	Ad hoc Informal Liaisons

Responsibilities of Joint CoCEP

(a) Review Progress of the Management and Operating Plans
(b) Develop and implement common standards for management (e.g. research, administration, tourism, community, etc.)

Issues of Concern

(a) Enforce Conservation and Protection of EPAR through AdEP and as a regional resource
(b) Develop education programs for Belize/Guatemala in management of resources
(c) Utilization as a contiguous park and biological corridor
(d) Identify funding sources and alternative combinations with a trust fund for EPAR

Members

Belize

Amigos de El Pilar~Lakin
Community Based Organization

Help for Progress
Non Government Organization

Dept. of Archaeology
National Institute of Culture & History
Government

Forestry Dept.
Government

University of West Indies
Education

Belize Tourism Industry Association
Non Government Organization

Belize Tourism Board
Government

Guatemala

Amigos de El Pilar~Chikin
Community Based Organization

Canan Kaax
Non Government Organization

Instituto de Antropologia e Historia IDAEH
Government

Consejo National de Areas Protegidas (CONAP) Government

Centro Universitaria del Petén
Education

FUNDATUR
Non Government Organization

Instituto Guatemalteco de Turismo (INGUAT) Government

Regional

Mesoamerican Biological Corridors
Treaty Organization

International

Research Program: BRASS/El Pilar Program
Education

Observer

Ministry of Foreign Affairs, Belize
Government

Appendix IV

Cultural Resource Plans For El Pilar

Excerpted from the Management Plans endorsed by PATEC-El Pilar 1999

Introduction – El Pilar Archaeological Reserve for Maya flora and fauna

Signatures Across the Landscape

The El Pilar has attracted an international, multidisciplinary team evolving a unique plan. This plan incorporates local community understanding, government conservation and development agenda, and international environmental concerns through an integrated research program that informs a model development plan centered on the history and prehistory of El Pilar.

This management plan for El Pilar is the result of a long process and involves the participation of many individuals from the local community, the government and private sectors, and the academy. The model springs from the research of the BRASS/El Pilar Program, but has been brought to fruition from participants the Mesa Redonda (1997, 1998, 2000). These key events set the stage for the creation of an innovative plan promoting a model interdisciplinary research and community development project that will serve as a model for conservation across the Maya forest.

The Past Informs the Future

The core of the El Pilar vision comes from archaeological research on the evolution of the ancient Maya landscape. The essence of this program acknowledges that clues to sustaining the complex habitats of today's Maya forest environment are embedded in Maya prehistory. Ancient Maya settlement and community patterns provide material evidence for the evolution of sustainable economies in one of the planet's last frontiers: the tropics.

The goals of the multidisciplinary research and development program are to demonstrate the critical relevance of basic research to promotion of conservation and development around the world today. The revelation of research results influence the application the reserve management plan that builds on the conservation of environmental diversity and preservation of the irreplaceable cultural heritage of both the ancient and contemporary populations in the region.

The Forest as a Garden

The ecological structure of the Maya forest is a relic of the dynamic relationship in which humans have played an integral part. This relationship extends back more than four millennia to the agricultural pioneers of the Maya forest region, the ancestors of the ancient Maya civilization and the heritage of contemporary farmers. The large contiguous stands of forest are a testimony to the efficacy of ancient Maya practices. While the Classic Maya collapse affected the human populations, plants and animals survived only to be threatened with extinction today. Therein lies the ecological lesson that must be perceived to build a sound basis for conservation in the future.

Traditional agricultural systems in the tropics worldwide are as complex as the environment within which they developed. Mimicking the forest structure, a complex poly-cultivation system evolved in tropical environments to reduce instability, prevent degradation, and integrate both intensive and extensive labor techniques that increase production. Heterogeneous and biodiverse, forest gardens constitute the strength of the Maya community in the past, as they do today, by relying on the traditional knowledge of local farming households.

Combining research designs of agronomists with those of traditional farmers from the area, the forest garden can form a model of ancient Maya land use to provide an ongoing source of innovation for the community. Such a design that uses ancient Maya settlement patterns and native agricultural knowledge foster resource conservation that aligns with, rather than opposes, the natural regenerative processes of the tropical forest.

Community Links

To accomplish the goal of improving living standards and self-sufficiency of the region's communities, the immediate and short-term needs of families must be incorporated into the long-term agenda of conservation. No reserve exists within a vacuum and to thrive the local population must assume an active role in the conservation responsibilities as well as benefits. With such community allies, the threats to the environment can be reduced and livelihoods improved. The El Pilar model provides and opportunity to demonstrate this.

A cooperative association has been established with Amigos de El Pilar. Their goal is to develop community enterprises in tourism and agriculture that increase civil society's economic stake in the reserve. Through education and participation, the links between the community and the reserve strengthen local investments in conservation and develop administrative responsibility. The leadership role the community has assumed and the self-determination they have gained in the process is the foundation for the success of the El Pilar model.

Discovering El Pilar

The stage has been set to develop an unique eco-archaeological tourism where the visitor can explore and discover the beautiful Maya architecture beneath the luxuriant forest canopy of the Maya forest.
The management plan design promotes education and training workshops, integration of lectures and tours, and encouraged participation in the archaeological and environmental research and the reserve. Further, community events sponsored around the El Pilar themes continue to elevate the visibility of El Pilar on the global front, providing a springboard for tourism development.

Taking the Challenge

Park management is fundamental to the long-term research and development envisioned in the El Pilar Management Plan. Informed designs and periodic reevaluation are based on cultural and ecological research. Further, incorporation of public interests, promotion of participation, articulation of the mission, and a clear set of objectives for the sustainable management of the reserve is essential. Finally, the extent of conservation goals, issues of access and education, and the long-term funding needs must be developed. These are detailed in this plan.

The El Pilar Management Plan includes the concerns and desires for both resource conservation and economic development. Short-term strategies for community involvement and long-term concerns for conservation of the ancient architecture and the environment are essential components. Educational and interpretive strategy for the park and surrounding landscape are also important. These facets are dependent upon the results of integrated, collaborative, and interdisciplinary research and program and are crucial to ongoing development of the El Pilar Archaeological Reserve for Maya Flora and Fauna. The reward will be a growing understanding of the ancient and contemporary dimensions of the Maya forest.

The management plan also takes into account the location of El Pilar between Cayo, Belize, and El Petén, Guatemala. This unusual setting impacts every aspect of research and development at El Pilar. The research projects and resource management designs for El Pilar must consider the contiguous sections of Belize and Guatemala as a whole, as regional resources shared between two countries. The natural environment, cultural resources, adjacent contemporary peoples, and access for tourism all figure prominently in the strategic research and development plan as well the ultimate product: The El Pilar Archaeological Reserve for Maya Flora and Fauna.

••••••••

Research and Monitoring Program for EPAR and the Maya forest

1. General Objectives: Research, Education, Conservation, Protection
   - (a) To focus on nexus of culture and nature
     - (i) Promote managed extraction strategies informed by science research for plants/animals (e.g. Corozo)
     - (ii) Education of community to participation in long term management of El Pilar
     - (iii) Encourage dissemination and publication of preliminary and final results
   - (b) To promote solicited and independent science projects that creatively consider culture and nature
     - (i) Standardized data collection methods to facilitate comparisons fixed to UTM grid location with comparable recording techniques
     - (ii) Maintain highest standards of scientific research by reviews within CoCEP
   - (c) To develop a comprehensive Geographic Information System (GIS) for the EPAR jointly with the Maya Forest Coalition that incorporates the scientific data collected at EPAR
   - (d) To maintain membership in Conservation and Environmental Data Systems (CEDS) for data sharing, GIS archiving, and management modeling for cultural and natural resources
   - (e) To organize an El Pilar research committee made up of research scientists working in the area
     - (i) To establish peer review process to evaluate research
     - (ii) To develop "handbook" for systematic and vicarious information gathered within the reserve and to encourage dissemination to the community

(iii) To promote centralized database of information (all information available, preliminary field reports of research/observations)
(iv) To track and coordinate access to preliminary reports and other grey literature
(v) To promote and facilitate research and permit process at El Pilar
(vi) To facilitate scientific enterprise and communications between scientists and between the committee and governments
(vii) To promote periodic scientific roundtables
(viii) To attract more research projects

2. General Activities:
   (a) Short Term
      (i) Develop portable teachers packages (audio/visual kits) for schools
      (ii) Contribute illustrative information to the Be Pukte and other community repositories
      (iii) Incorporate new data into the trail guide for the EPAR reserve
      (iv) Document the EPAR reserve research and development process
      (v) Issues to address
         - Permit-processing
         - Areas of investigation
         - Research advisory committee membership
   (b) Medium /Long Term
      (i) Visitor Center and associated educational presentations on research programs
      (ii) Promotion of the forest-as-a-Garden model for El Pilar
      (iii) Promote model for interdisciplinary research
      (iv) Realize the conceptual integration of culture and nature

3. Cultural Resources Objectives for EPAR and the Maya forest
   (a) To adhere to the conservation principles: the Athens Charter 1931, the Venice Charter 1964, and the Burra Charter 1966 (see International Council on Monuments and Sites – ICOMOS - Web site: www.icomos.org)
   (b) To understand the prehistory, history, and contemporary development of El Pilar (archaeological, survey, excavation, archives, library)
   (c) To promote a coherent cultural resource conservation program in the context of the Maya forest for one El Pilar
   (d) To develop a conservation monitoring program to maintain El Pilar
   (e) To adopt the theme of *Travel Through Time* and *View Everyday Life* –past, present, future

4. Cultural Resources Activities
   (a) Short Term
      (i) Inventory of cultural remains to establish a research and monitoring baseline
      (ii) Investigate the construction sequence of Nohol and Xaman Pilar using the tunneling method focused at Copal (EP7) and the Hemena (EP20)
      (iii) Continue development of the Forest Garden to show aspects of everyday life
      (iv) Complete the excavation, exposition, and consolidation at 1) Tzunu'un, 2) EP7 stairs of Copal, 3) Jobo
      (v) Initiate monitoring system for consolidation program and institute improvements
      (vi) Develop cultural conservation program
   (b) Medium/Long Term
      (i) Include Pilar Poniente, Kum, and other monuments of Chikin area in trail system
      (ii) Complete the excavation, exposition, and consolidation at key locations of 1) Copal, 2) Gumbolimbo, 3) Ixim, 4) Axcanan
      (iii) Expand the forest garden developments in the mosaic of land use areas in one EPAR
      (iv) Continue to monitor conservation strategies for revisions and improvements
      (v) Analyze and publish results of research and conservation programs in academic and popular sources
      (vi) Promote innovative conservation programs at EPAR for the Maya forest
      (vii) Establish the varied aspects of the model mosaic of ancient Maya life ways in the different identified natural life zone systems within the reserve

5. Natural Resources Objectives
   (a) To understand the natural history of El Pilar
   (b) To promote an appreciation of the human interface with the natural environment at El Pilar, past and present
   (c) To focus on the dynamics of the forest through research on succession, edge effects, and examination of equilibrium
   (d) To determine indicator species for monitoring program based on the WCS protocols
   (e) To demonstrate the necessity of wildlife corridors and viability of small reserves like EPAR
   (f) To document the contribution of EPAR to the maintenance of biodiversity and refuges for life forms

6. Natural Resources Activities
   (a) Short Term
      (i) Inventory of species and communities of plants and animals for baseline
      (ii) Establish permanent monitoring plots and transects for research and monitoring programs
      (iii) Determine baseline soils, species, and succession stages of forest within EPAR
      (iv) Implement protocol for monitoring at EPAR based on WCS inputs and standards
      (v) Establish air photography base and ground proofing
   (b) Medium /Long Term
      (i) Periodic monitoring of permanent plots and transects (as needed, at least every 5 yrs)
      (ii) Measure dynamics of forest through research programs
      (iii) Analyze and publish results of research and conservation programs in academic and popular literature
      (iv) Promote conservation program models at EPAR for the Maya forest

7. Meet Integrated monitoring and management concerns
      (i) Maintain natural environment in public areas respecting the irreplaceable cultural resources
      (ii) Manage natural environment on monuments with landscaping and planting
      (iii) Determine impact standards on natural and cultural resources in public areas
      (iv) Incorporate community monitors to increase local investment
      (v) Design tourism trails to enhance resource monitoring agenda
      (vi) Promote an integrated management strategy among related agencies (Archaeology, Forestry, Lands etc.)
      (vii) Propagate model for the regional conservation of cultural and natural resources

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